Claims

1. (currently amended) A plastid transformation vector for stably transforming a plastid, comprising, as operably-linked components, a first flanking sequence, a DNA sequence coding for a IFNα2b or a polypeptide having at least 95 percent sequence identity therewith~~therapeutic human interferon (IFN)~~, which is capable of expression in a plastid, and a second flanking sequence, wherein said IFNα2b or polypeptide is competent to produce an immunogenic response in a mammal.

2. (currently amended) The vector of claim 1, wherein said IFNα2b or polypeptide ~~therapeutic human IFN~~ further comprises a polyhistidine purification tag and a thrombin cleavage site.

3. (currently amended) The vector of claim 1 further comprising a regulatory sequence.

4. (currently amended) The vector of claim 3, wherein said regulatory sequence comprises a promoter operative in ~~said~~ a plastid genome.

5. (original) The vector of claim 4, wherein said promoter is 16srRNA.

6. (currently amended) The vector of claim 3, wherein said regulatory sequence comprises light regulated psbA 5'~~,~~ and psbA 3' elements.

7. (cancelled).

8. (cancelled).

9. (cancelled).

10. (original) The vector of claim 1, wherein the vector is competent for stabling integrating into a plastid genome of a plant cell and wherein the flanking DNA sequences are substantially homologous to sequences in a spacer region of said plastid genome.

11. (original) The vector of claim 10, wherein said spacer region is a transcriptionally

active spacer region.

12. (currently amended) The vector of claim 1, wherein the plastid is selected from the group consisting of chloroplast, chromoplast, amyloplast, proplastide, ~~leucoplast~~ and etioplast.

13. (currently amended) The vector of claim 3, wherein said regulatory sequence further comprises a 5' untranslated region (5'UTR) capable of providing transcription and translation enhancement of said DNA sequence coding for IFNα2b or said polypeptide~~therapeutic human interferon (IFN)~~.

14. (currently amended) The vector of claim 3, wherein said regulatory ~~sequences~~sequence further comprises a 3' untranslated region (3'UTR) capable of conferring transcript stability to said IFNα2b or said polypeptide~~therapeutic human interferon (IFN)~~.

15. (original) The vector of claim 1, wherein said first flanking sequence is trnI, and wherein said second flanking sequence is trnA.

16. (currently amended) The vector of claim 15, wherein trnI and trnA provide for homologous recombination to insert ~~an~~ said DNA sequence ~~IFN containing cassette~~ into the spacer region in an inverted repeat region of a chloroplast genome.

17. (currently amended) The vector of claim 1, wherein said vector inserts said DNA sequence coding for IFNα2b or said polypeptide ~~therapeutic human interferon IFN is located in~~into a single copy region of ~~said~~ a plastid genome.

18. (original) The vector of claim 13, wherein said 5' UTR is a 5'UTR of psbA.

19. (original) The vector of claim 14, wherein said 3'UTR is a 3'UTR of psbA.

20. (original) The vector of claim 1, further comprising a DNA sequence encoding a selectable marker.

21. (original) The vector of claim 20, wherein said selectable marker is an antibiotic-free selectable marker.

22. (original) The vector of claim 21, wherein said antibiotic-free selectable marker is Betaine aldehyde dehydrogenase (BADH).

23. (original) The vector of claim 20, wherein said DNA sequence encoding a selectable marker encodes an antibiotic resistant selectable marker.

24. (original) The vector of claim 23, wherein said antibiotic resistant selectable marker is aadA.

25. (currently amended) A method for producing IFNα2b~~IFN~~ or a polypeptide having at least 99 percent sequence identity therewith, said method comprising: integrating the plastid transformation vector of claim 1 into the plastid genome of a plant cell; and growing said plant cell to thereby express said IFNα2b~~IFN~~, wherein said IFNα2b or polypeptide is competent to produce an immunogenic response in a mammal.

26. (cancelled).

27. (cancelled)

28. (cancelled).

29. (cancelled).

30. (cancelled)

31. (cancelled).

32. (cancelled).

33. (currently amended) A method for variable-expressing IFNα2b~~IFN~~ or a polypeptide having at least 99 percent sequence identity therewith comprising: ~~integrating~~ transforming a plastid genome of a plant cell with a transformation vector according to claim 1 ~~into a plastid genome of a plant cell~~; and ~~growing~~ regenerating said plant cell ~~to express~~into a plant that expresses said IFNα2b or polypeptide~~recombinant therapeutic human interferon IFN~~.

34. (currently amended) The method of claim 33, further comprising: extracting said IFNα2b~~IFN~~ or said polypeptide from leaves of ~~a stably transformed~~said plant and isolating IFNα2b or said polypeptide from other plant proteins.

35. (currently amended) A plant stably transformed with the transformation vector of claim 1, so as to express IFNα2b or a polypeptide having at least 95 percent sequence identity therewith, wherein the IFNα2b or the polypeptide is competent to induce an immunogenic response in a mammal.

36. (original) A progeny of the plant of claim 35.

37. (original) A seed of the plant of claim 35.

38. (currently amended) A part of the plant of claim 35, comprising a plastid including said DNA sequence coding said IFNα2b or said polypeptide~~for therapeutic human interferon IFN~~.

39. (original) The plant of claim 35, wherein said plant is an edible plant suitable for mammal consumption.

40. (original) The plant of claim 39, wherein said edible plant is LAMD-609.

41. (currently amended) The plant of claim 35, wherein said plant further comprises at least one chloroplast transformed with ~~the vector of claim 1~~said vector.

42. (currently amended) The plant of claim 35, wherein said plant further comprises mature leaves transformed with ~~the vector of claim 1~~said vector.

43. (currently amended) The plant of claim 35, wherein said plant further comprises young leaves transformed with ~~the vector of claim 1~~said vector.

44. (currently amended) The plant of claim 35, wherein said plant further comprises old leaves transformed with ~~the vector of claim 1~~said vector.

45. (currently amended) The plant of claim 40, wherein the expression of IFNα2b or said

polypeptide~~IFN~~ is at least about 6.0 percent total soluble protein.

46. (currently amended) The plant of claim 40, wherein said expression of IFNα2b or said polypeptide ~~IFN~~ in said edible plant is about 12.5 percent total soluble protein.

47. (original) The plant of claim 35, wherein said plant is *Nicotiana tabacum* cv. Petit Havana.

48. (currently amended) The plant of claim 47, wherein the expression of IFNα2b or said polypeptide ~~IFN~~ in said Nicotiana tabacum cv. Petit Havana is at least 4.0 percent total soluble protein.

49. (currently amended) The plant of claim 47, wherein the expression of IFNα2b or said polypeptide~~IFN~~ in said *Nicotiana tabacum* cv. Petit Havana is about 18.5 percent total soluble protein.

50. (cancelled).

51. (currently amended) A plastid transformation vector for a stably transforming a plastid genome, said vector comprising, as operably-linked components, a first flanking sequence, a DNA sequence coding for IFNα2b or a polypeptide having at least 95 percent sequence identity therewith~~a therapeutic human interferon IFN or a substantially homologous DNA sequence of therapeutic human interferon IFN~~, wherein the IFNα2b or the polypeptide having at least 95 percent sequence identity therewith~~therapeutic human interferon IFN~~ is operably linked to a polyhistidine purification tag and a thrombin cleavage site, and a second flanking sequence.

52. (cancelled).